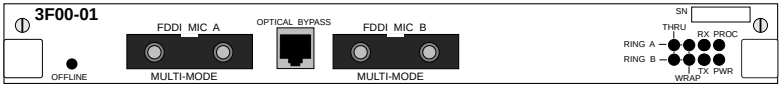
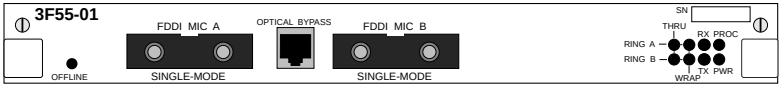
FDDI DUAL-ATTACHED INTELLIGENT MODULE (3F00-01 AND 3F55-01) USER'S GUIDE





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Manufacturer's Name:	**Cabletron Systems, Inc.**
Manufacturer's Address:	**35 Industrial Way** **PO Box 5005** **Rochester, NH 03867**
European Representative Name:	**Mr. J. Solari**
European Representative Address:	**Cabletron Systems Limited** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG13 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EC Directive 73/23/EEC** **EN 55022** **EN 50082-1** **EN 60950**
Equipment Type/Environment:	**Networking Equipment, for use in a Commercial or Light Industrial Environment.**

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

Manufacturer	Legal Representative in Europe
Mr. Ronald Fotino	Mr. J. Solari
Full Name	Full Name
Principal Compliance Engineer	Managing Director - E.M.E.A.
Title	Title
Rochester, NH, USA	Newbury, Berkshire, England
Location	Location

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CHAPTER 1
INTRODUCTION

This manual is for system administrators responsible for configuring, monitoring, and maintaining the ATX. It should be used with the *ATX User Guide* and the *ATX MIB Reference Guide*. The contents of each chapter are described below.

- Chapter 1, **Introduction**, outlines the contents of this manual and provides an overview of the 3F00-01 and 3F55-01.
- Chapter 2, **Connecting to the Network**, describes how to physically attach the module to a network.
- Chapter 3, **Configuring the 3F00-01 and 3F55-01**, discusses the software configuration options for the module.
- Chapter 4, **Monitoring and Managing the 3F00-01 and 3F55-01**, provides information on the statistics and traffic analysis available for the module.
- Chapter 5, **Diagnostics and Troubleshooting**, discusses detecting problems with the module and how to solve them.
- Chapter 6, **Adding/Swapping Modules**, gives instructions for installing a new 3F00-01/3F55-01 and replacing a 3F00-01/3F55-01.
- Appendix A, **Technical Specifications**, lists technical information about the module.
- Appendix B, **Cabling Information**, provides cable pinouts.

1.1 OVERVIEW

The FDDI 3F00-01 and the 3F55-01 are dual-attached modules that connect the ATX to a Fiber Distributed Data Interface (FDDI) network. Multiple 3F55-01s and 3F00-01s can be installed in one ATX.

Both modules support a wide range of applications, such as intra-facility or campus backbones, and client/server configurations. Figure 1-1 shows a typical campus backbone application, with the ATX linking independent workgroups on Ethernet and Token-Ring LANs to a high-performance FDDI backbone.

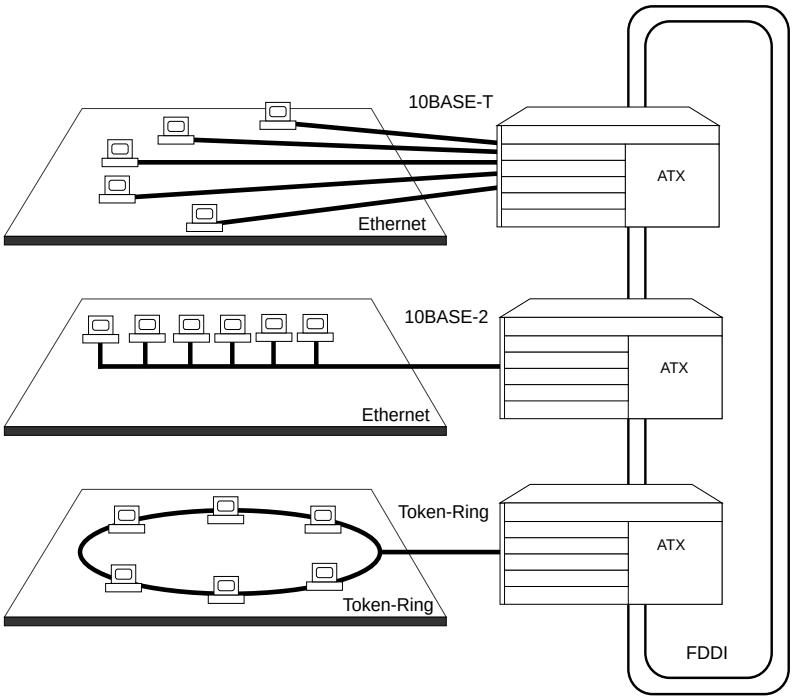

Figure 1-1 Typical Network Configuration

The 3F00-01 uses standard multimode fiber. The 3F55-01 uses single mode fiber for extended distance capability. The extended distance capability for single mode fiber is dependent upon how you want to allocate your power budget. The 3F00-01 and the 3F55-01 allow the ATX to be connected to the FDDI ring as a dual-attached station, dual-homed single-attached station, or single attached station. Both modules support

an external Optical Bypass Switch (OBS) that allows full FDDI operation to continue if the ATX is disabled.

Both FDDI standard station management (SMT) and SNMP are supported, allowing you to use a variety of network management software to configure your 3F00-01/3F55-01 and monitor your network.

Both the 3F00-01 and 3F55-01 are protected by a built-in temperature sensor that sends an alarm if the module overheats. Local and remote loopback tests on the module, and front panel LEDs showing the ring status, aid in troubleshooting and diagnostics.

1.2 STANDARDS

The 3F00-01 and 3F55-01 comply with the following standards:

- ANSI X3T9.5 (PMD, PHY, MAC, and SMT)
- IEEE 802.1d and 802.1i

1.3 CONNECTORS

The 3F00-01 and 3F55-01 each have three connectors that are shown in Figure 1-2 and Figure 1-3:

- Two Media Interface Connector (MIC) receptacles – an A port and a B port.
- One RJ-11 modular jack, for connecting an optional Optical Bypass Switch (OBS). (The OBS is not supplied with the 3F00-01 or the 3F55-01.)

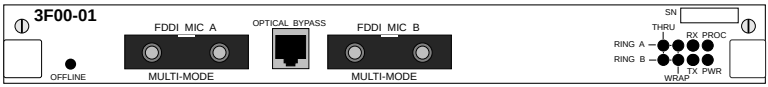

Figure 1-2 3F00-01 Front Panel

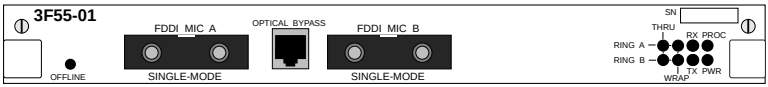

Figure 1-3 3F55-01 Front Panel

1.4 LEDS

The 3F00-01 front panel (Figure 1-2) contains 8 green LEDs:

- Processor status (PROC)
- Power OK (PWR)
- Receive activity (RX)
- Transmit activity (TX)
- Thru mode – one per primary and secondary ring (THRU)
- Wrap mode – one per primary and secondary ring (WRAP)

The 3F55-01 front panel (Figure 1-3) contains 8 green LEDs:

- Processor status (PROC)
- Power OK (PWR)
- Receive activity (RX)
- Transmit activity (TX)
- Thru mode – one per primary and secondary ring (WRAP)
- Wrap mode – one per primary and secondary ring (THRU)

1.5 DOCUMENT CONVENTIONS

The following conventions are used in presenting information in this manual:

LCM commands, prompts, and information displayed by the computer appear in Courier typeface:

```
Current Number of Static Addresses: 5
Current Number of Learned Addresses: 133
Number of Defined Filters: 4
```

Information that you enter appears in Courier bold typeface:

```
ATX >status
```

Information that you need to enter with a command is enclosed in angle brackets < >. For example, you must enter a MAC address to execute the address matrix `<MAC address>` command:

```
ATX >address matrix 00:40:27:04:1a:0f
```

Field value options appear in bold typeface. For example, a filter type can be either **Entry** or **Exit**.

Note: A note provides additional information or describes the possible consequence of a specific action you may perform.

Caution: A caution alerts you that a specific action you may perform could damage your computer equipment, server communication with your ATX, or cause data to be lost.

Warning: A warning means you could cause physical harm to yourself. Follow the guidelines in the manual or on the unit itself when handling electrical equipment.

1.6 RELATED DOCUMENTATION

You may need to refer to the following documentation when you are using your ATX:

- *ATX User Guide* – contains installation and configuration instructions for the ATX.
- *ATX MIB Reference Guide* – contains the SMC Enterprise MIB.

If you need internetworking reference material, you may find the following books helpful:

- *Interconnections, Bridges and Routers*, Radia Perlman, Addison Wesley © 1992.
- *Internetworking with TCP/IP: Principles, Protocols, and Architecture* (2nd edition), Volumes I and II, Douglas Comer, Prentice Hall © 1991.
- *The Simple Book, An Introduction to Management of TCP/IP-based Internets*, Marshall T. Rose, Prentice Hall © 1991.

1.7 GETTING HELP

If you need additional support related to this device, or if you have any questions, comments, or suggestions concerning this manual, contact the Cabletron Systems Global Call Center:

Phone	(603) 332-9400
Internet mail	support@ctron.com
FTP Login Password	ctron.com (134.141.197.25) *anonymous* *your email address*
BBS Modem setting	(603) 335-3358 8N1: 8 data bits, No parity, 1 stop bit
For additional information about Cabletron Systems or our products, visit our World Wide Web site: **http://www.cabletron.com/** For technical support, select **Service and Support**.	

Before calling the Cabletron Systems Global Call Center, have the following information ready:

- Your Cabletron Systems service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem (e.g., changing mode switches, rebooting the unit, etc.)
- The serial and revision numbers of all involved Cabletron Systems products in the network
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)
- Any previous Return Material Authorization (RMA) numbers

CHAPTER 2
CONNECTING TO THE NETWORK

The 3F00-01/3F55-01 can be installed in any slot, and more than one can be installed in your ATX. Refer to the *ATX User Guide* for instructions on how to unpack, power up, and check your ATX before continuing with this chapter.

Instructions for installing or swapping an 3F00-01 or 3F55-01 are included in Chapter 6, **Adding/Swapping Modules**.

2.1 CONFIGURATION OPTIONS

Both the 3F00-01 and the 3F55-01 permit the ATX to attach to the FDDI ring as a dual-attached station using either multimode (3F00-01) or single mode (3F55-01) fiber respectively. They both can also be configured with an optional Optical Bypass Switch.

2.1.1 Dual-attached Station

A dual-attached station (DAS) is connected to both the primary and secondary FDDI rings. This is the preferred configuration, since it provides the full benefits of dual-ring operation, allowing the network to continue to operate if a station or cable fails.

Figure 2-1 shows the ATX, with a 3F00-01 installed, connected as a DAS to two other DASs in an FDDI network. (A and B indicate A port and B port.) When DAS devices are connected on an FDDI ring, A ports must be connected to B ports, and B ports must be connected to A ports.

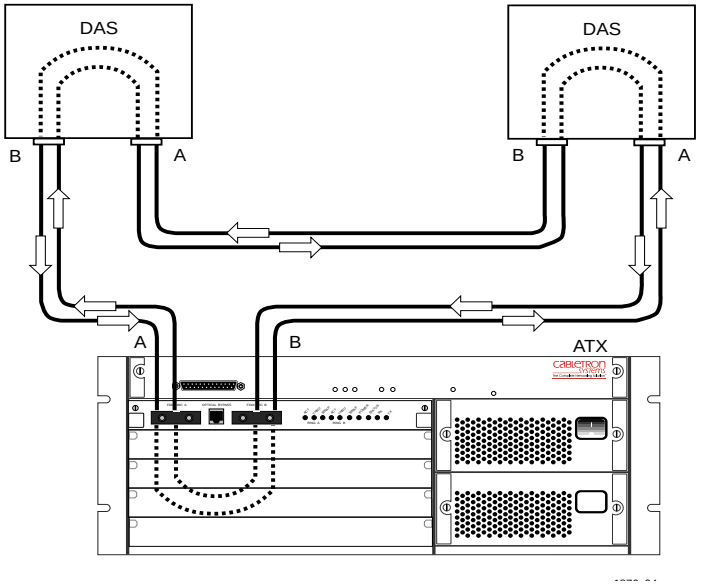

Figure 2-1 Dual-attached Configuration

2.1.2 Dual-homed Single-attached Station

Dual-homing is a method of connecting concentrators and stations that permits an alternate or backup path to the dual ring in case the primary connection fails.

The connection is normally made via dual-attached concentrators (DACs) which are connected to both the primary and secondary FDDI rings. Other FDDI stations or concentrators are connected to the DAC master (M) ports.

Figure 2-2 shows the ATX, with a 3F00-01 installed, connected to the master ports of two DACs.

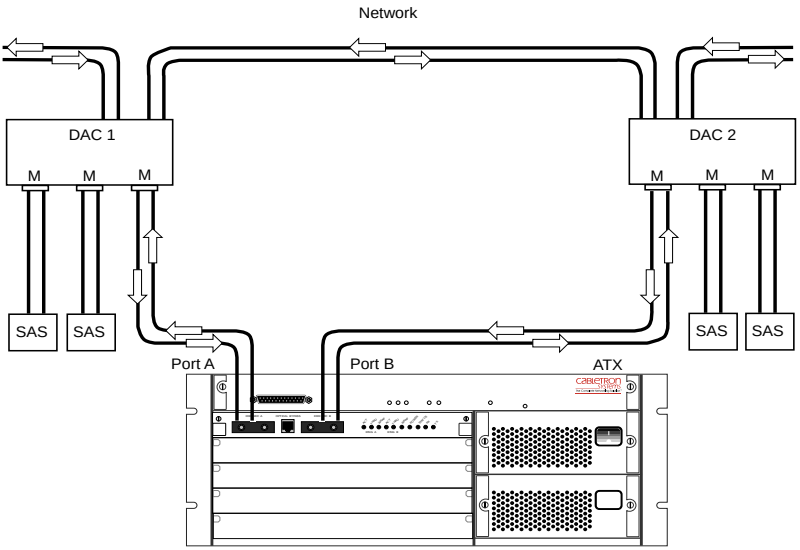

Figure 2-2 Dual-homed Single-attached Configuration

In this configuration, the ATX accesses the FDDI ring through port B and DAC 2. FDDI standards for DASs such as the ATX state that if the B port cannot be used, the device will automatically use its A port. Therefore, if DAC 2 fails, the ATX is still connected to the ring through port A (DAC 1).

2.1.3 Single-attached Station

A single-attached station (SAS) is an FDDI station that uses only one connection (an S port) for connection to the FDDI ring.

Figure 2-3 shows the ATX, with a 3F00-01 installed, configured as an SAS, connected to a master port of a dual-attached concentrator (DAC) on the main FDDI ring.

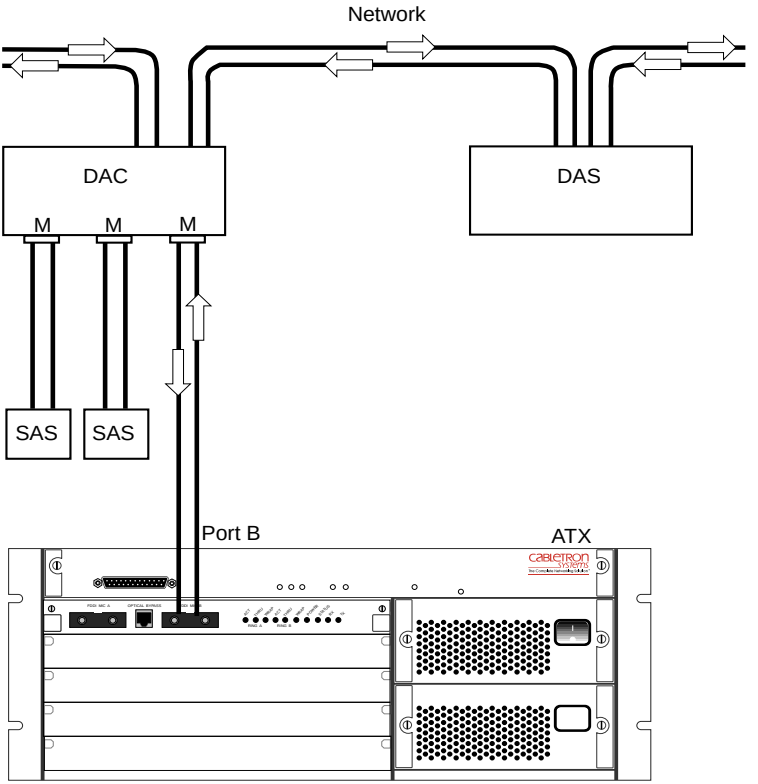

Figure 2-3 Single-attached Configuration

2.1.4 Optical Bypass Switch

An Optical Bypass Switch (OBS) may be used to provide added protection when the ATX is configured as a DAS. If an OBS is connected to the 3F00-01 or 3F55-01, and a failure occurs at the ATX, the OBS automatically isolates the ATX from the rest of the network by reconfiguring the FDDI dual rings as shown in Figure 2-4.

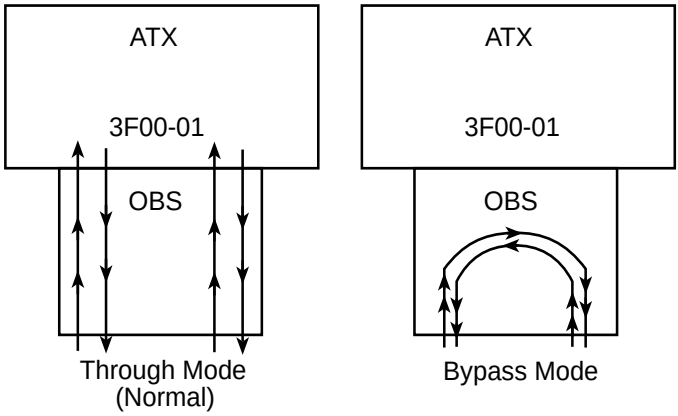

Figure 2-4 Optical Bypass Switch Operation

This avoids ring "wrapping" (automatic reconfiguration to isolate a fault) and ring re-initialization. In addition, an OBS makes it possible to disconnect the ATX from the network without disrupting the FDDI rings.

2.2 LED POWER-UP SEQUENCE

Before connecting the 3F00-01 or 3F55-01 to the network, power on the ATX and observe the automatic power-up diagnostics sequence of the front panel LEDs to check for proper operation. Refer to the *ATX User Guide* for instructions on how to power up the ATX.

Each of the modules in the ATX is tested in order, (from top to bottom of the unit). The power-up sequence takes between 1 and 2 minutes, depending on the ATX configuration.

2.2.1 3F00-01 LED Sequence

Figure 2-5 shows the positions of the LEDs on the 3F00-01 front panel.

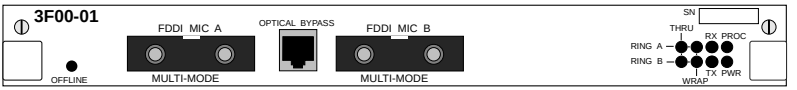

Figure 2-5 3F00-01 LEDs

The LED power-up sequence for the 3F00-01 is as follows:

1. All LEDs light briefly and turn off, except for the PWR LED, which remains on.
2. The STATUS LED lights while power-up diagnostics are being run on the 3F00-01.
3. The TX and RX LEDs flash.
4. The STATUS LED goes off while diagnostics are running on the other modules in the ATX.
5. The STATUS LED lights again when the 3F00-01 software initializes and remains on.
6. The RING A and RING B RX, TX, THRU, and WRAP LEDs remain off until the module is connected to the network.

Note: RING A refers to the primary FDDI ring, and RING B to the secondary FDDI ring. These LEDs do NOT correspond to FDDI MIC A and FDDI MIC B.

2.2.2 3F55-01 LED Sequence

Figure 2-6 shows the positions of the LEDs on the 3F55-01 front panel.

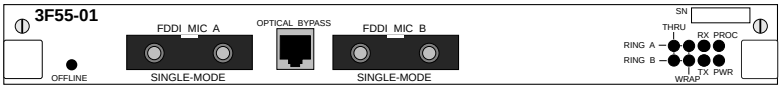

Figure 2-6 3F55-01 LEDs

The LED power-up sequence for the 3F55-01 is as follows:

1. All LEDs light briefly and turn off, except for the PWR LED, which remains on.
2. The PROC LED lights while power-up diagnostics are being run on the 3F55-01.
3. The WRAP LED for Ring A lights briefly.
4. The TX and RX LEDs flash.
5. The PROC LED lights again when the 3F55-01 software initializes and remains on.
6. The RING A and RING B RX, TX, THRU, and WRAP LEDs remain off until the module is connected to the network.

Note: RING A refers to the primary FDDI ring, and RING B to the secondary FDDI ring. These LEDs do NOT correspond to FDDI MIC A and FDDI MIC B.

2.3 KEYING OF MEDIA INTERFACE CONNECTORS

Optical fiber connections are made using a Media Interface Connector (MIC). A MIC consists of two parts:

- The MIC plug, which terminates the optical fiber cable
- The MIC receptacle, which is on the FDDI node or station

To ensure that the MIC plugs and MIC port receptacles are correctly mated, FDDI standards state that different types of MIC plugs and receptacles must be keyed as one of the following:

- A (primary in/secondary out)
- B (secondary in/primary out)
- M (master)
- S (slave)

Matching slots are used to identify the MIC plugs and receptacles of the same type. The MIC key slot must be the correct type for the MIC receptacle (A, B, M, or S) and must be properly aligned, or you will not be able to connect the MIC.

The key slot may be permanently molded into the MIC, although many vendors supply one MIC that can be alternately keyed as an A, B, M, or S connector. Several MIC vendors provide an attached dust cover that fits over the end of the MIC plug and contains three small plastic pieces which may be fitted into the MIC to provide the appropriate keying.

The small movable pieces used to key MIC connectors are usually marked (A, B, M, or S) and are often color coded (usually: red=MIC A, blue or yellow = MIC B). However, since color coding is not specified in the FDDI standards, there is no standard color coding scheme.

2.3.1 A and B Keying

To install the ATX as a DAS, the preferred configuration, a MIC A and MIC B are required.

Figure 2-7 shows the keying scheme used to differentiate A and B MICs, which are identified on the 3F00-01 and 3F55-01 front panel as FDDI MIC A and FDDI MIC B respectively.

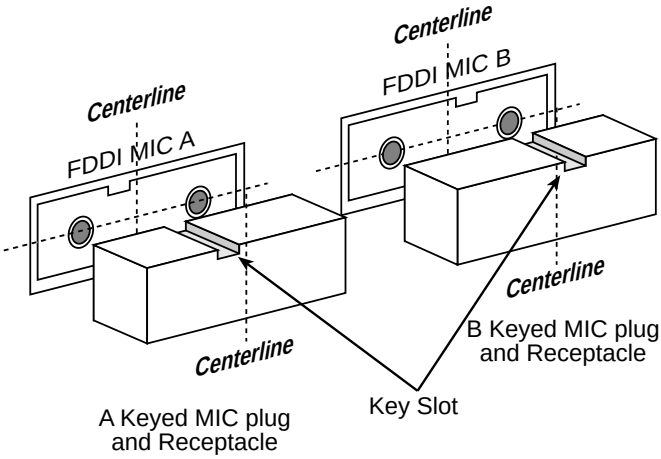

Figure 2-7 MIC A and MIC B Keying

Looking into the open end of the receptacle, an A key slot is to the left of the horizontal center of the MIC and a B key slot is to the right of the MIC center. The arrows indicate how the plug mates to the receptacle.

Note: If you are making a fiber cable assembly to connect FDDI DAS devices, the MIC plug on one end must be keyed as a MIC A, and the MIC plug on the other end must be keyed as a MIC B. This will help ensure that devices are correctly connected. Also, FDDI terminations should always be labeled for connection to port A or port B.

2.3.2 M and S Keying

MICs on concentrators are keyed as type M MICs to connect to a master port (for the attachment) of stations or other concentrators, and type S MICs to connect to a slave port (for attachment to the FDDI network).

For M port connections the MIC key slot runs along the center of the connector.

2.4 CONNECTING THE 3F00-01 OR 3F55-01 TO THE NETWORK

Caution: Power-off the ATX before connecting the 3F00-01 or 3F55-01 to the network. Failure to disconnect power will result in damage to the module. The steps for connecting a 3F00-01 or 3F55-01 to the network are the same.

The 3F00-01 and 3F55-01 connect the ATX to the FDDI network as a dual-attached station, dual-homed single-attached station, or single-attached station. Use the appropriate 3F00-01 or 3F55-01; either the multimode version or single mode version, depending on the type of fiber used for the network.

2.4.1 Pre-connection Information

Check that MICs are correctly keyed as A and B MICs for connecting DAS ports.

If MICs are keyed incorrectly, the FDDI network may continue to function, but the incorrectly connected station will not function. The dual ring will "twist around," bypassing the faulty connection. The ring configuration LED on the 3F00-01 or 3F55-01 (either the THRU or WRAP LED) will blink.

Before connecting the FDDI cable, inspect the MIC plug and receptacle contact points to make sure they are clean. (To protect fiber ends from dust or other contamination, always keep the open ends of unused MIC plugs and receptacles covered with a dust cover.)

Caution: Only properly trained personnel should attempt to fabricate an FDDI cable assembly or polish fiber cable terminations.

2.4.2 Connecting Dual-attached Stations

The cable assembly consists of a fiber cable (either multimode or single mode, depending on the type of module you are using) with a MIC A plug on one end and a MIC B plug on the other end. Two cable assemblies are required for each ATX that you are connecting.

Note: Remember, when DASs are connected on an FDDI ring, A ports (MIC A) must be connected to B Ports (MIC B), and B ports must be connected to A ports.

1. Attach the MIC A plug on the end of one cable assembly to the receptacle labeled "FDDI MIC A" on the module front panel (Figure 2-8).
2. Attach the MIC B plug on the other end to the MIC B receptacle on the first DAS.
3. Attach the MIC B plug on the end of the second cable assembly to the receptacle labeled "FDDI MIC B" on the module front panel (Figure 2-8).
4. Attach the MIC A plug on the other end of the second cable to the MIC A receptacle on the second DAS.
5. Check the LEDs. In this configuration the RING A RX, TX and THRU LEDs will be on.

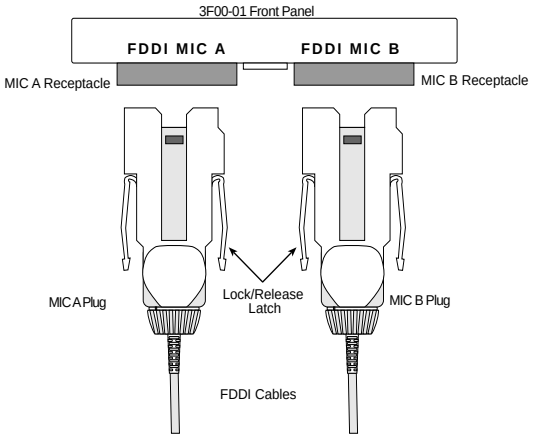

Figure 2-8 3F00-01 MIC Connections

2.4.3 Connecting Dual-homed Single-attached Stations

Two cable assemblies are required for each ATX. One consists of a fiber cable with a MIC A plug on one end and a MIC M plug on the other end, and the second consists of a fiber cable with a MIC B plug on one end and a MIC M plug on the other end.

1. Attach the MIC A plug on the end of the first cable assembly to the receptacle labeled “FDDI MIC A” on the module front panel (Figure 2-8).
2. Attach the MIC M plug on the other end of the first cable to the master port MIC M receptacle on the first DAC.
3. Attach the MIC B plug on the end of the second cable assembly to the receptacle labeled “FDDI MIC B” on the module front panel (Figure 2-8).
4. Attach the MIC M plug on the other end of the second cable to the master port MIC M receptacle on the second DAC.
5. Check the LEDs. In this configuration the RING B RX, TX and WRAP LEDs will be on.

2.4.4 Connecting Single-attached Stations

The cable assembly consists of one fiber cable with a MIC B plug on one end and a MIC M plug on the other end.

Warning: When you are using a single-mode cable, ***do not look at the end of the cable****. The single-mode cable uses a laser, which could cause damage to your eye if you look directly into it.*

1. Attach the MIC B plug on one end of the cable assembly to the receptacle labeled “FDDI MIC B” on the module front panel (Figure 2-8).
2. Attach the MIC M plug on the other end to the master port MIC M receptacle on the DAC.
3. Check the LEDs. In this configuration the RING B RX, TX and WRAP LEDs will be on.

You can use a MIC A plug and the FDDI MIC A receptacle instead of MIC B, in which case the equivalent RING A LEDs will be on.

2.4.5 Connecting the Optical Bypass Switch

The OBS has three built-in cables with MIC A and MIC B plugs and a male RJ-11 connector for connecting to the 3F00-01 or 3F55-01. It also contains MIC A and MIC B receptacles for connecting to the ring. Figure 2-9 shows the OBS connectors.

You also need two cable assemblies consisting of a fiber cable appropriate to the type of cabling you are using (either multimode or single mode) with a MIC A plug on one end and a MIC B plug on the other end to connect the OBS to the ring.

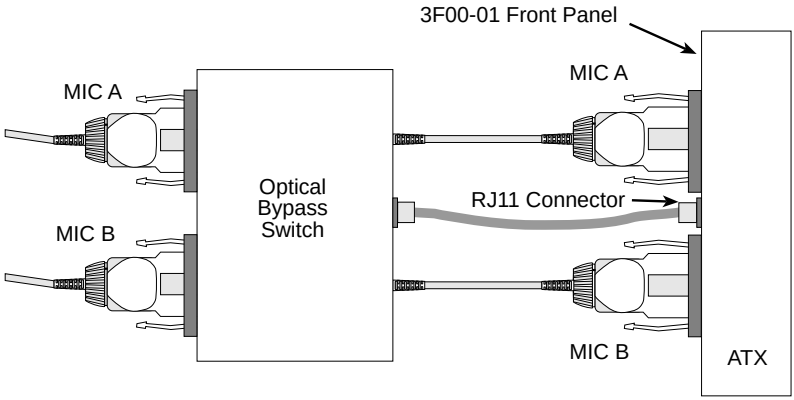

Figure 2-9 Connecting the Optical Bypass Switch

1. Attach the MIC A and MIC B plugs on the OBS to the receptacles labeled “FDDI MIC A” and “FDDI MIC B” respectively on the module front panel.
2. Plug the male RJ-11 connector on the OBS into the female RJ-11 connector on the module front panel.
3. Attach the MIC A plug on the end of the first cable assembly to the MIC A receptacle on the OBS (Figure 2-9).

4. Attach the MIC B plug on the other end of the first cable to the MIC B receptacle on the first DAS.
5. Attach the MIC B plug on the end of the second cable assembly to the MIC B receptacle on the OBS (Figure 2-9).
6. Attach the MIC A plug on the other end of the second cable to the MIC A receptacle on the second DAS.
7. Check the LEDs. In this configuration the RING A RX, TX and THRU LEDs will be on.

CHAPTER 3
CONFIGURING THE 3F00-01 AND 3F55-01

You can configure your 3F00-01 and 3F55-01 using the following tools:

- Local Console Manager (LCM), an application that allows you to monitor, manage, and configure your ATX through an out-of-band RS-232 connection.
- Remote Console Manager, a remote standalone configuration application
- EliteView/UX, an SNMP-based network management system
- EliteView/OV, an SNMP-based network management software module for HP's OpenView
- EliteView/NV, an SNMP-based network management software module for IBM's NetView/6000 network management systems
- Any SNMP-based network management system

For more details about LCM, see your *ATX User Guide*. For details about the other network management software, refer to the product's documentation.

3.1 CONFIGURATION

Refer to the *ATX User Guide* for the LCM configuration commands common to all I/O modules. Configuration information particular to the 3F00-01 and 3F55-01 is described below. Version 2.4 of the ATX system software supports SMT version 7.3. Versions of ATX system software prior to 2.4 support SMT version 6.2.

3.1.1 SMT Version 6.2

Some of the SMT version 6.2 MIB variables (`snmpFddiSMT 2`) have had their access types extended from Read-Only to Read-Write. These variables can be written to, using a Network Management Station (NMS). The variables with extended access include:

- `snmpFddiSMTStationId` – The port's unique eight byte SMT station identifier (corresponds to ANSI `fddiSMT 11`). Setting the lower six bytes to zero will cause the unit to automatically use the port's MAC address in the lower six bytes.
- `snmpFddiMACTMax` – The MAC's value for `T_Max` (corresponds to ANSI `fddiMAC 53`). Possible values range from 32 to 2,097,120.
- `snmpFddiMACTvxValue` – The MAC's value for `Tvx` (corresponds to ANSI `fddiMAC 54`). Possible values range from 255 to 65,025.
- `snmpFddiMACFrameCts` – The MAC's `Frame_Ct` (corresponds to ANSI `fddiMAC 71`). Any attempt to write this parameter will cause the MAC's `Frame_Ct`, `Error_Ct`, and `Lost_Ct` to be zeroed.
- `snmpFddiMACErrorCts` – The MAC's `Error_ Ct` (corresponds to ANSI `fddiMAC 81`). Any attempt to write this parameter will cause the MAC's `Frame_Ct`, `Error_Ct`, and `Lost_Ct` to be zeroed.
- `snmpFddiMACFrameErrorThreshold` – Value for the `fddiMACFrameErrorThreshold` variable (corresponds to ANSI `fddiMAC 95`).

Variables in the SMC enterprise MIB can be set to specify under what conditions traps should be sent to an NMS. (Refer to the *ATX MIB Reference Guide* for more detailed information.) Those variables include:

- `sfddiSmtConditions` – SMT conditions which should be reported to the NMS via SNMP traps.
- `sfddiSrfConditions` – SRF conditions which should be reported for the NMS via SNMP traps.

In the SMC enterprise MIB, you can set a variable to connect to port B:

- `sfddiThruB` – Whether to connect to the FDDI port B (not applicable for single-attached stations).

3.1.2 SMT Version 7.3

Some of the SMT version 7.3 MIB variables (`fddimibSMT 2`) have had their access types extended from Read-Only to Read-Write. These variables can be written to, using an NMS. The variables with extended access include:

- `fddimibSMTStationId` – The port's unique eight byte SMT station identifier (corresponds to ANSI `fddiSMT 11`). Setting the lower six bytes to zero will cause the unit to automatically use the port's MAC address in the lower six bytes.
- `fddimibMACFramesCts` – A count of the number of frames received by this MAC (corresponds to ANSI {fddiMAC 71}, refer to ANSI MAC 7.5.1). Any attempt to write this parameter will cause the MAC's `Frame_Ct`, `Copied_Ct`, `Transmit_Ct`, `Error_Ct`, and `Lost_Ct` to be zeroed.
- `fddimibMACCopiedCts` – A count that should, as closely as possible, match the number of frames addressed to (A bit set) and successfully copied into the station's receive buffers (C bit set) by this MAC (corresponds to ANSI {fddiMAC 72}, refer to ANSI MAC 7.5). Note that this count does not include MAC frames. Any attempt to write this parameter will cause the MAC's `Frame_Ct`, `Copied_Ct`, `Transmit_Ct`, `Error_Ct`, and `Lost_Ct` to be zeroed.
- `fddimibMACTransmitCts` – A count that should, as closely as possible, match the number of frames transmitted by this MAC (corresponds to ANSI {fddiMAC 73}, refer to ANSI MAC 7.5). Note that this count does not include MAC frames. Any attempt to write this parameter will cause the MAC's `Frame_Ct`, `Copied_Ct`, `Transmit_Ct`, `Error_Ct`, and `Lost_Ct` to be zeroed.
- `fddimibMACErrorCts` – A count of the number of frames that were detected in error by this MAC that had not been detected in error by another MAC (corresponds to ANSI {fddiMAC 81}, refer to ANSI MAC 7.5.2). Any attempt to write this parameter will cause the MAC's `Frame_Ct`, `Copied_Ct`, `Transmit_Ct`, `Error_Ct`, and `Lost_Ct` to be zeroed.

- `fddimibMACLostCts` – A count of the number of instances that this MAC detected a format error during frame reception such that the frame was stripped (corresponds to ANSI {fddiMAC 82}, refer to ANSI MAC 7.5.3). Any attempt to write this parameter will cause the MAC's `Frame_Ct`, `Copied_Ct`, `Transmit_Ct`, `Error_Ct`, and `Lost_Ct` to be zeroed.

Some of the SMT version 7.3 MIB variables (`fddimibSMT 2`) have had their access types restricted from Read-Write to Read-Only. The variables with restricted access include:

- `fddimibSMTConfigPolicy` – A value that indicates the configuration policies currently desired in a node (corresponds to ANSI {fddiSMT 26}). This is always 0.
- `fddimibMACRequestedPaths` – List of permitted paths which specifies the path(s) into which the MAC may be inserted (corresponds to ANSI {fddiMAC 32}, refer to ANSI SMT 9.7). Only default setting as defined in SMT 9.7 is supported.
- `fddimibPORTConnectionPolicies` – A value representing the port's connection policies desired in the node (corresponds to 'none', the second octet to 'tree', and the third octet to 'peer'.

Variables in the SMC enterprise MIB can be set to specify under what conditions traps should be sent to an NMS. (Refer to the *ATX MIB Reference Guide* for more detailed information.) Those variables include:

- `sfddiSmtConditions` – SMT conditions which should be reported to the NMS via SNMP traps.
- `sfddiSrfConditions` – SRF conditions which should be reported for the NMS via SNMP traps.

In the SMC enterprise MIB, you can set a variable to connect to port B:

- `sfddiThruB` – Whether to connect to the FDDI port B (not applicable for single-attached stations).

CHAPTER 4

MONITORING AND MANAGING THE 3F00-01 AND 3F55-01

You can monitor your 3F00-01 and 3F55-01 using the following network management software:

- Local Console Manager (LCM), an application that allows you to monitor, manage, and configure your ATX through an out-of-band RS-232 connection.
- Remote Console Manager, a remote standalone configuration application
- EliteView/UX, an SNMP-based network management system
- EliteView/OV, an SNMP-based network management software module for HP's OpenView
- EliteView/NV, an SNMP-based network management software module for IBM's NetView/6000 network management systems
- Any SNMP-based network management system

This chapter describes some basic monitoring functions you can perform using LCM, and additional information you can access using the network management software listed above.

For more details about LCM, refer to the *ATX User Guide*. For details about the other network management software, refer to the product's documentation.

4.1 DISPLAYING THE MODULE STATUS

To display the status of the 3F00-01 and 3F55-01, at the LCM prompt type:

```
ATX >status
Current Number of Learned Addresses: 34
Number of Defined Filters: 2
ModuleType        DiagStatus          InUse    TempOk   Ports
1    PPE          Passed              True     Normal   1
2    FDDI-IOM     Passed              True     Normal   2
3    CSMA-IOM     Passed              True     Normal   3
4    HSSI-IOM     Passed              True     Normal   4
5    IFDDI-IOM    Passed              True     Normal   5
6    TR-IOM       Passed              True     Normal   6
Displaying the 3F00-01 Port Status
```

To display the status of a 3F00-01 or 3F55-01 port using LCM, at the LCM prompt type:

```
ATX > status <port number>
```

The port number is determined by counting from the first port on the top-most module in the ATX, which is the Packet Processing Engine (PPE).

The status of a 3F00-01 or 3F55-01 port includes:

- Type – There are six possible values for the module type, two for the 3F00-01 and four for the 3F55-01. The types are listed below:
  - FDDI DAS
  - FDDI DAS Single Mode
  - Intelligent FDDI DAS
  - Intelligent DAS Single Mode
  - Intelligent DAS Single Mode on MIC A
  - Intelligent DAS Single Mode on MIC B
- Bridging – which functions have been enabled for bridging (see the `bridge` command).
- Routing – which functions have been enabled for bridging (see the `iproute` or `ipxroute` commands).

- Enabled/Disabled – enabled if it is operational, or disabled if you used the `disable` command to disable it. If the port is enabled but not operational, its status will be broken. (A port could be broken if it is so badly misconfigured as to be unusable, or if the port cannot connect to the logical ring).
- Spanning Tree – the port's Spanning Tree state. The following states apply to the Spanning Tree protocol:
  - Blocking – The port is not currently the designated port to a LAN and is therefore not forwarding any packets. (This means there is another route to that LAN and since the Spanning Tree protocol does not allow simultaneous redundant paths this port is blocked. If the other route to that LAN goes down, this port would then start forwarding).
  - Listening – The port is listening for other bridges on the network to determine if it should go to the forwarding or blocking state.
  - Learning – The port is listening for other bridges on the network and making a table of addresses from packets it has received. Once the port goes to the forwarding state, it can then use the address information it has learned.
  - Forwarding – The port is the designated port for the LAN and is forwarding packets and sending out bridge protocol packets.
  - Broken – The port is not forwarding packets. Reasons include no cable connected, no link status, the ring is not operational, or an NMS has disabled the port.
  - Disabled – The port is not configured for Spanning Tree.
  - Packets Transmitted – number of packets transmitted from the port. This includes any packets that might have experienced transmission errors. (The port's statistics are reset whenever the port is started.)
  - Packets Received – number of good packets received through the port. Packets with reception errors are not included, nor are packets local to that segment that are hardware filtered. (All ports automatically filter most local traffic without actually receiving the packets, so the count may be lower than the LAN's actual packet count. You can use an NMS to set the `sifFilterLocal` MIB variable to disable a port's automatic filtering.)

- Small Buffers – number of buffers currently assigned to the port (see RX_Q Overflows below).
- RX_Q Overflows – number of packets dropped by the port due to a lack of buffers. After a reboot, the ATX tries to automatically re-allocate the Small Buffers among the ports so the total number of RX_Q Overflows is minimized.
- Ring State – either `Ring_Op` or `Isolated`, although there are a number of intermediate RMT states that are possible while the ring is in transition.
- Port Config – normally `DAS_THRU_A`. It is possible for the port to wrap or be isolated when there are ring breaks. If the two FDDI cables have been incorrectly connected `Twisted` will be displayed as the port status.

Note: All counter values are reset to zeros if the ATX is rebooted or if the module housing that port is halted and restarted.

4.2 STATISTICS

The ATX collects statistics applicable to I/O modules and ports and stores them in the following MIBs: the portion of MIB-2, the bridge MIB, the FDDI MIB, and the SMC enterprise MIB. You can access the stored information using an SNMP-based NMS. Refer to your NMS documentation for instructions. The following statistics are available for the 3F00-01 and 3F55-01:

- Module Status and Statistics
- Port Status and Statistics
  - General Port Status and Statistics
  - Port Receive Statistics
  - Port Transmit Statistics
  - Port Error Status and Statistics
- 3F00-01/3F55-01 Port SMT Status
- 3F00-01/3F55-01 Port MAC Status
- 3F00-01/3F55-01 Port PHY Status

4.2.1 Module Status and Statistics

The status and statistics described in this section are applicable to an I/O module:

- Whether the module's temperature is too hot. [`hwTempOK`]
- Results of diagnostics, when diagnostics were last performed on the module (usually power-up). Possible values: diagnostics failed, diagnostics still running, diagnostics passed. Status code for the diagnostics that were last run on the module. [`hwDiagCode`]
- Whether the module is currently executing its operational software. [`hwInuse`]
- The manufacturing information for this module which includes part number, hardware revision level, and serial number. [`hwManufData`]

4.2.2 Port Status and Statistics

The status and statistics described in this section are applicable to any port.

4.2.2.1 General Port Status and Statistics

- The time, in centi-seconds (hundredth of a second), the port entered its last state shown in the port, which will be one of the following:
  - UP
    The port can send/receive NMS packets; however, whether or not the port has its bridging and/or routing functions enabled is not indicated.
    [`ifOperStatus = 1`]
  - DOWN
    The port is broken, or is intentionally physically disabled
    [`ifOperStatus = 2`]
  - TESTING
    The port is in local loopback [`ifOperStatus = 3`]
- The port type, which would be FDDI

- The MAC address of the port [`ifPhysAddress`]
- The size (in bytes) of the largest network datagram which may be sent/ received on the port. This does not include the MAC header, LLC header, and FCS. For the 3F00-01/3F55-01, the size is 4352. [`ifMtu`]
- The port's estimated MAC-level bandwidth, in bits per second. The bandwidth for the 3F00-01 is 100,000,000. [`ifSpeed`]
- The maximum length ever obtained by the port's outbound packet queue (in packets). [`ifOutQLen`]
- The number of packets received by the port may be obtained by adding the number of unicast packets received by the port and the number of non-unicast packets received by the port. [`ifInUcastPkts+ifInNUcastPkts`]
- The total number of bytes received on the port, counting the MAC header and FCS, but not counting the bytes in packets that were rejected due to hardware errors. All counters are 32 bit wide wrap-around counters which can only be reset by rebooting the ATX. [`ifInOctets`]
- The number of packets transmitted by the port may be obtained by adding the number of unicast packets transmitted by the port and the number of non-unicast packets transmitted by the port. [`ifOutUcastPkts+ifOutNUcastPkts`]
- The total number of bytes transmitted on the port, counting the MAC header and FCS, but not counting the bytes in packets that were rejected due to hardware errors. [`ifOutOctets`]

4.2.2.2 Port Receive Statistics

- Number of characters in the forwarded received packets, [`sifRxChars0`]
- Number of characters in the filtered received packets, [`sifRxChars1`]

4.2.2.3 Port Transmit Statistics

- The number of Bridge Mgmt Unicast packets transmitted. [`sifTxPackets` viewed as a 5-entry array of 4 bytes each indexed by `DEST_UBRIDGE`]
- The number of Bridge Mgmt Multicast packets transmitted. [`sifTxPackets` viewed as a 5-entry array of 4 bytes each indexed by `DEST_MBRIDGE`]
- The number of known unicast packets transmitted. [`sifTxPackets` viewed as a 5-entry array of 4 bytes each indexed by `DEST_KNOWN`]
- The number of unknown unicast packets transmitted. [`sifTxPackets` viewed as a 5-entry array of 4 bytes each indexed by `DEST_UNKNOWN`]
- The number of multicast packets transmitted. [`sifTxPackets` viewed as a 5-entry array of 4 bytes each indexed by `DEST_MULTI`]

4.2.2.4 Port Error Status and Statistics

- A list of up to 16 MAC addresses; the source addresses of the last 16 packets that were not sent due to packet size limitations. [`sifTxAddr`]
- Number of received packets discarded due to size errors. [`sifRxSizeErrors`]
- Number of received packets discarded due to FCS errors. [`sifRxHwFCS`]
- Number of times the receiver queue overflowed. [`sifRxQueue`]
- The number of packets received by the port, which were sent to the LMA; but the LMA discarded the packets because of unknown or unsupported protocol. [`ifInUnknownProtos`]
- Number of packets not transmitted due to transmit congestion. [`sifTxCongest`]
- Number of packets not sent due to protection against a multicast storm. [`sifTxStorm`]
- Number of packets not sent due to a destination port filtering restriction. [`sifTxDest`]
- Number of packets not sent due to size limitations. [`sifTxSize`]

- The number of packets to be transmitted out the port, that incurred transmission hardware errors. [`ifOutErrors`]
- The number of packets to be transmitted out the port, but were not transmitted due to congestion detected by the IOM combined with congestion detected by the PPE. [`ifOutDiscards`]
- The number of packets that were discarded due to receive abort errors. [`sfddiRxHwAbort`]

The following Port Error Statistics are available for the 3F00-01 only:

- The number of DPC errors. [`sfddiDpcErrCnt`]
- The number of RBC errors. [`sfddiRbcErrCnt`]

4.2.3 3F00-01/3F55-01 Port SMT Status

Station management (SMT) refers to the entity within a station on an FDDI ring that monitors and controls station activity. Version 2.4 of the ATX system software supports SMT version 7.3. Versions of ATX system software prior to 2.4 support SMT version 6.2. In the sections that follow, the SMT version 6.2 MIB variables are presented first, followed by the SMT version 7.3 versions.

4.2.3.1 SMT Version 6.2

- Version of SMT that this port is using. [`snmpFddiSMTOpVersionId`]
- The highest version of SMT that is supported by this port. [`snmpFddiSMTHiVersionId`]
- The lowest version of SMT that is supported by this port. [`snmpFddiSMTLoVersionId`]
- The number of MACs connected to this port. This is always 1. [`snmpFddiSMTMACCt`]
- The number of PHYs connected to this port. This is always 2. [`snmpFddiSMTNonMasterCt`]

- The number of Master ports. This is always 0. [snmpFddiSMTMasterCt]
- The types of paths available. This is always 1 (primary path only). [snmpFddiSMTPathsAvailable]
- The capabilities that are supported by the port. This is always 0. [snmpFddiSMTConfigCapabilities]
- The capabilities that are currently being enforced by the port. This is always 0. [snmpFddiSMTConfigPolicy]
- The connection restrictions that are currently being enforced by the port. [snmpFddiSMTConnectionPolicy]
- The value for the NIF T_Notify timer, in seconds. [snmpFddiSMTNotify]
- Whether the port supports the SRF protocol. This is always true (1). [snmpFddiSMTStatusReporting]
- The current state of the port's ECM state machine. [snmpFddiSMTECMState]
- The current state of the port's CFM state machine. [snmpFddiSMTCFState]
- The current state of the port's Hold function. This is always not-implemented (1). [snmpFddiSMTHoldState]
- Whether the port has been intentionally disconnected. [snmpFddiSMTRemoteDisconnectFlag]
- A value that is greater than, or equal to, the time stamp used in the last SMT frame. [snmpFddiSMTMsgTimeStamp]
- The time stamp of the last SRF condition or event. [snmpFddiSMTTransitionTimeStamp]

4.2.3.2 SMT Version 7.3

- Used to uniquely identify an FDDI station. [fddimibSMTStationId]
- The version that this station is using for its operation. [fddimibSMTOpVersionId]

- The highest version of SMT that this station supports. [fddimibSMTHiVersionId]
- The lowest version of SMT that this station supports. [fddimibSMTLoVersionId]
- This variable contains 32 octets of user defined information. [fddimibSMTUserData]
- The version of the FDDI MIB of this station. [fddimibSMTMIBVersionId]
- The number of MACs in this station or concentrator. [fddimibSMTMACCts]
- The value of this variable is the number of A, B, and S ports in this station or concentrator. [fddimibSMTNonMasterCts]
- The number of M ports in a node. [fddimibSMTMasterCts]
- A value that indicates the path types available in the station. [fddimibSMTAvailablePaths]
- A value that indicates the configuration capabilities of a node. [fddimibSMTConfigCapabilities]
- A value that indicates the configuration policies currently desired in a node. [fddimibSMTConfigPolicy]
- The connection restrictions that are currently being enforced by the port. [fddimibSMTConnectionPolicy]
- The timer, expressed in seconds, used in the Neighbor Notification protocol. [fddimibSMTTNotify]
- Indicates whether the node will generate Status Reporting Frames for its implemented events and conditions. [fddimibSMTStatRptPolicy]
- Reference Trace_Max maximum propagation time for a trace on an FDDI topology. [fddimibSMTTraceMaxExpiration]
- A flag indicating if the station has a bypass on its A/B port pair. [fddimibSMTBypassPresent]
- Indicates the current state of the ECM state machine. [fddimibSMTECMState]

- The attachment configuration for the station or concentrator. [fddimibSMTCFState]
- Whether the port has been intentionally disconnected. [fddimibSMTRemoteDisconnectFlag]
- The current status of the primary and secondary paths within this station. [fddimibSMTStationStatus]
- This variable assumes the value of the PeerWrapFlag in CFM. [fddimibSMTPeerWrapFlag]
- This variable assumes the value of the TimeStamp, in the unit of millisecond. [fddimibSMTTimeStamp]
- This variable assumes the value of TransitionTimeStamp, in the unit of milliseconds. [fddimibSMTTransitionTimeStamp]
- An SMT action to be performed. [fddimibSMTStationAction]

4.2.4 3F00-01/3F55-01 Port MAC Status

Media Access Control (MAC) is the data link layer sublayer responsible for scheduling, transmitting, and receiving data on a shared medium local area network. Versions of system software prior to 2.4 support SMT version 6.2. In the sections that follow, the SMT version 6.2 MIB variables are presented first, followed by the SMT version 7.3 versions.

4.2.4.1 SMT Version 6.2

- Detailed status of the last DPC error. [sfddiDpcErrValue]
- Detailed status of the last RBC error. [sfddiRbcErrValue]
- Whether any packets were received with 16 bit MAC addresses. [sfddiShortAddressing]
- Indicates the station's bridge/end-station capabilities. This is always FSC-Type0 (1). [snmpFddiMACFrameStatusCapabilities]
- Of this MAC's paths, the greatest lower bound of T_Max supported. Every MAC has just one path, so this is simply the lower bound of T_MAX, which is always -32. [snmpFddiMACTMaxGreatestLowerBound]

- Of this MAC's paths, the greatest lower bound of TVX supported. Every MAC has just one path, so this is simply the lower bound of TVX, which is always -255. [snmpFddiMACTVXGreatestLowerBound]
- The paths available for this MAC. This is none (0), unless the FDDI ring is operational (Ring_Op is True), in which case this is the Primary (1) path. [snmpFddiMACCurrentPath]
- The current path associated with this MAC. This is isolated (16), unless the FDDI ring is operational (Ring_Op is True), in which case this is the Primary (2) path. [snmpFddiMACCurrentPath]
- The MAC address of this MAC's upstream neighbor. [snmpFddiMACUpstreamNbr]
- Whether the upstream neighbor is a Station or a Concentrator. [snmpsmtUpstreamDescriptor]
- The topology state of this station on the ring which may be one or more of the following: [snmpsmtUpstreamState.Topology]
  - Station is wrapped
  - Station is an unrooted concentrator
  - Station is in a twisted ring
  - Station is a rooted station
- Whether a duplicate address was detected by this station or its upstream neighbor. [snmpsmtUpstreamState.Dup1Address]
- The date/time the NMS read this duplicate address detected condition. This date/time is not the same as the date/time the port detected the condition.
- The MAC address of this MAC's previous upstream neighbor. [snmpFddiMACO1dUpstreamNbr]
- The current status of this MAC's Duplicate Address Test. [snmpFddiMACDupAddrTest]

- The path(s) desired for this MAC. This is always the Primary (1) path. [snmpFddiMACPathsRequested]
- The PC_Type of the MAC's downstream neighbor. The ATX uses a value of 5 when PC_Type is not known. [snmpFddiMACDownstreamPORTType]
- The MAC's value for T_Req. [snmpFddiMACTReq]
- The T_Neg value determined by this MAC. [snmpFddiMACTNeg]
- The MAC's value for T_Max. Possible values range from -32 to -2,097,120. [snmpFddiMACTMax]
- The MAC's value for Tvx. [snmpFddiMACTvxValue]
- The MAC's value for T_Min. This is always -32. [snmpFddiMACTMin]
- The current usage of the station's bridge/end-station capabilities. This is always FSC-Type0 (1). [snmpFddiMACCurrentFrameStatus]
- The MAC's Frame_Ct. [snmpFddiMACFrameCt]
- The MAC's Error_Ct. [snmpFddiMACLostCt]
- The MAC's Lost_Ct. [snmpFddiMACLostCt]
- The current state of the MAC's RMT state machine. [snmpFddiMACRMTState]
- The current value of the MAC's RMT DA_Flag. [snmpFddiMACDAFlag]
- Whether a MAC Frame Error condition is present. This is always False (2), since the ANSI standard does not specify what this is. [snmpFddiMACFrameMACCondition]

4.2.4.2 SMT Version 7.3

- Whether any packets were received with 16 bit MAC addresses. [sfddiShortAddressing]
- The number of FDDI ports configured in Configuration EEPROM. [fddimibMACNumber]
- Indicates the MAC's optional Frame Status processing functions. [fddimibMACFrameStatusFunctions]

- Indicates the maximum time value (in nanoseconds) of `fddiMACTMax` that this MAC can support. [`fddimibMACTMaxCapability`]
- Indicates the maximum time value (in nanoseconds) of `fddiMACTvxValue` that this MAC can support. [`fddimibMACTVXCapability`]
- Indicates the paths available for this MAC. [`fddimibMACAvailablePaths`]
- Indicates the path into which this MAC is currently inserted. [`fddimibMACCurrentPath`]
- The MAC's upstream neighbor's long individual MAC address. [`fddimibMACUpstreamNbr`]
- The MAC's downstream neighbor's long individual MAC address. [`fddimibMACDownstreamNbr`]
- The previous value of the MAC's upstream neighbor's long individual MAC address. [`fddimibMACO1dUpstreamNbr`]
- The previous value of the MAC's downstream neighbor's long individual MAC address. [`fddimibMACO1dDownstreamNbr`]
- The Duplicate Address Test flag, `Dup_Addr_Test`. [`fddimibMACDupAddressTest`]
- List of permitted paths which specifies the path(s) into which the MAC may be inserted. [`fddimibMACRequestedPaths`]
- Indicates the PC-Type of the first port that is downstream of this MAC. [`fddimibMACDownstreamPORTType`]
- The 48-bit individual address of the MAC used for SMT frames. [`fddimibMACSMTAddress`]
- This variable is the `T_Req` value passed to the MAC. [`fddimibMACTReq`]
- The `T_Neg` value determined by this MAC. [`fddimibMACTNeg`]
- This variable is the `T_Max` value passed to the MAC. [`fddimibMACTMax`]
- This variable is the `TVX_value` passed to the MAC. [`fddimibMACTvxValue`]

- A count of the number of frames received by this MAC. [fddimibMACFrameCts]
- A count that should, as closely as possible, match the number of frames addressed to (A bit set) and successfully copied into the station's receive buffers (C bit set) by this MAC. [fddimibMACCopiedCts]
- A count that should, as closely as possible, match the number of frames transmitted by this MAC. [fddimibMACTransmitCts]
- A count of the number of frames that were detected in error by this MAC that had not been detected in error by another MAC. [fddimibMACErrorCts]
- A count of the number of instances that this MAC detected a format error during frame reception such that the frame was stripped. [fddimibMACLostCts]
- A threshold (0..65536) for determining when a MAC Condition report shall be generated. [fddimibMACFrameErrorThreshold]
- The actual frame error ratio (corresponds to ANSI {fddiMAC 96}). [fddimibMACFrameErrorRatio]
- Indicates the current state of the RMT State Machine. [fddimibMACRMTState]
- The RMT flag Duplicate Address Flag, DA_Flag. [fddimibMACDaFlag]
- A flag set when the upstream neighbor reports a duplicate address condition. [fddimibMACUnaDaFlag]
- Indicates the MAC Frame Error Condition is present when set. [fddimibMACFrameErrorFlag]
- This variable shall take on the value of the MAC_Avail flag defined in RMT. [fddimibMACMAUnitdataAvailable]
- This variable indicates the presence of underlying hardware support for this MAC object. [fddimibMACHardwarePresent]
- The variable determines the value of the MA_UNITDATA_Enable flag in RMT. [fddimibMACMAUnitdataEnable]

4.2.5 3F00-01/3F55-01 Port PHY Status

Physical Layer Protocol (PHY) is the FDDI standard that defines symbols, line states, clocking requirements, and the encoding of data for transmission. Versions of system software prior to 2.3 support SMT version 6.2. In the sections that follow, the SMT version 6.2 MIB variables are presented first, followed by the SMT version 7.3 versions.

4.2.5.1 SMT Version 6.2

- Identifies the port as a DAS [`snmpFddiATTACHMENTSMTClass = 2 means DAS`]
- Whether the port has an optical bypass. [`snmpFddiATTACHMENTOpticalBypassPresent`]
- The value of `I_Max`. [`snmpFddiATTACHMENTIMaxExpiration`] (This is always -125,000 which corresponds to 10 milliseconds.)

The following status information is available for each of the two PHYs of the FDDI port:

- Indicates the PHY's `PC_Type`. [`snmpFddiPORTPCType`]
- Indicates the PC_Type of the PHY's neighbor. [`snmpFddiPORTPCNeighbor`]
- Indicates the PHY's signaling. [`snmpFddiPORTConnectionPolicies`]
- Indicates the PHY's received signals. [`snmpFddiPORTRemoteMACIndicated`]
- The value for `T_Next (9)`, i.e., the time for the MAC local loop. This is always -2,500,000, which corresponds to 200 milliseconds. [`snmpFddiPORTMACLoopTime`]
- The value for `TB_Max`. This is always -625,000, which corresponds to 50 milliseconds. [`snmpFddiPORTTBMax`]
- The `BS_Flag` of the associated PHY. [`snmpFddiPORTTBSFlag`]
- The `PC_LCT_Fail` of the associated PHY. [`snmpFddiPORTLCTFailCt`]
- The `LER_Estimate` of the associated PHY. [`snmpFddiPORTLerEstimateCt`]

- The `LEM_Reject_Ct` of the associated PHY. [`snmpFddiPORTLemRejectCt`]
- The value of the PHY's `LER_Cutoff`. [`snmpFddiPORTLerCutoff`]
- The value of the PHY's `LER_Alarm`. [`snmpFddiPORTLerAlarm`]
- The PHY's current connection state. [`snmpFddiPORTConnectState`]
- The current state of the PHY's PCM state machine. [`snmpFddiPORTPCMState`]
- The value of the PHY's `PC_Withhold`. This is always none (1). [`snmpFddiPORTPCWithhold`]

4.2.5.2 SMT Version 7.3

- The total number of PHYs possible (across all FDDI ports) on this unit. [`fddimibPORTNumber`]
- The value of the PORT's `PC_Type`. [`fddimibPORTMyType`]
- The type of the remote PORT as determined in PCM. [`fddimibPORTNeighborType`]
- A value representing the PORT's connection policies desired in the node. [`fddimibPORTConnectionPolicies`]
- The indications (`T_Val (9)`, `R_Val (9)` in PC-Signalling, of the intent to place a MAC in the output token path to a PORT. [`fddimibPORTIndicated`]
- Indicates the Path(s) into which this PORT is currently inserted. [`fddimibPORTCurrentPath`]
- This variable is a list of permitted Paths where each list element defines the PORT's permitted Paths. [`fddimibPORTRequestedPaths`]
- Indicates the MAC, if any, whose transmit path exits the station via this PORT. [`fddimibPORTMACPlacement`]
- Indicates the Paths which are available to this PORT. [`fddimibPORTAvailablePaths`]
- This variable indicates the type of PMD entity associated with this PORT. [`fddimibPORTPMDClass`]

- A value that indicates the connection capabilities of the PORT. [fddimibPORTConnectionCapabilities]
- This variable assumes the value of the BS_Flag. [fddimibPORTBSFlag]
- The count of the consecutive times the Link Confidence Test (LCT) has failed during connection management. [fddimibPORTLCTFailCts]
- A long term average link error rate. [fddimibPORTLerEstimate]
- A link error monitoring count of the times that a link has been rejected. [fddimibPORTLemRejectCts]
- The aggregate link error monitor error count, set to zero only on station initialization. [fddimibPORTLemCts]
- The link error rate estimate at which a link connection will be broken. [fddimibPORTLerCutoff]
- The link error rate estimate at which a link connection will generate an alarm. [fddimibPORTLerAlarm]
- An indication of the connect state of this PORT which is equal to the value of Connect_State. [fddimibPORTConnectState]
- The state of this PORT's PCM state machine. [fddimibPORTPCMState]
- The value of PC_Withhold. [fddimibPORTPCWithhold]
- The condition becomes active when the value of fddiPORTLerEstimate is less than or equal to fddiPORTLerAlarm. [fddimibPORTLerFlag]
- This variable indicates the presence of underlying hardware support for this PORT object. [fddimibPORTHardwarePresent]
- A PORT action to be performed. [fddimibPORTAction]

4.2.6 3F00-01/3F55-01 PATH Group

This group applies to SMT version 7.3 only.

- The total number of PATHs possible (across all FDDI ports) on this unit. [fddimibPATHNumber]
- Specifies the minimum time value of fddiMACTvxValue that shall be used by the MAC that is configured in this PATH. [fddimibPATHTVXLowerBound]

- Specifies the minimum time value of `fddiMACTMax` that shall be used by the MAC that is configured in this PATH. [`fddimibPATHTMaxLowerBound`]
- Specifies the minimum time value of `fddiMACTReq` that shall be used by the MAC that is configured in this PATH. [`fddimibPATHMaxTReq`]
- A table of PATH configuration entries. [`fddimibPATHConfigTable`]
- A set of operational attributes for a PATH configuration entry. [`fddimibPATHConfigEntry`]
- The value of the SMT index associated with this configuration entry. [`fddimibPATHConfigSMTIndex`]
- The value of the PATH resource index associated with this configuration entry. [`fddimibPATHConfigPATHIndex`]
- An object associated with Token order for this entry. [`fddimibPATHConfigTokenOrder`]
- The type of resource associated with this configuration entry. [`fddimibPATHConfigResourceType`]
- The value of the SMT resource index used to refer to the instance of this MAC or Port resource. [`fddimibPATHConfigResourceIndex`]
- The current insertion status for this resource on this PATH. [`fddimibPATHConfigCurrentPath`]

CHAPTER 5
DIAGNOSTICS AND TROUBLESHOOTING

Built-in diagnostic capabilities for the 3F00-01 and 3F55-01 include:

- Power-up diagnostics, which are run every time the 3F00-01/3F55-01 is brought online.
- Front panel status LEDs
- Local and remote loopback tests.
- Temperature sensors.

5.1 POWER-UP TESTS

The power-up diagnostics test processors, memory, and other critical components on all ATX modules. Power-up diagnostics also verify proper interaction between all the modules.

Each of the interface modules is tested in order (from top to bottom of the ATX). LEDs on the front panel indicate progress of the power-up diagnostics sequence and the status of each module as determined by the power-up diagnostics.

The 3F00-01 and 3F55-01 LED power-up sequence is described in detail in Chapter 2, **Connecting to the Network**.

When the power-up diagnostics are completed (this takes between 1 and 2 minutes after power is applied, depending on the configuration of the ATX), the appropriate traps (alarms or event messages) are generated and sent to the NMS.

If a 3F00-01 or 3F55-01 fails a critical test, it is automatically disabled.

After completion of the power-up diagnostics, the 3F00-01/3F55-01 status LEDs should operate as shown in Table 5-1 and Table 5-2.

Table 5-1 Meaning of 3F00-01 LEDs

LED	Meaning
THRU	On - Ring A or B (as indicated by LED label) is in through mode Flashing - Ring is twisted
WRAP	On - Ring A or B (as indicated by LED label) is in wrap mode Flashing - Ring is twisted
STATUS	On - 3F00-01 hardware is ready for operation (port may or may not be enabled – controlled by software)
POWER	On - 3F00-01 hardware is receiving power
RX	Flashing - Port is receiving data
TX	Flashing - Port is transmitting data

Table 5-2 Meaning of 3F55-01 LEDs

LED	Meaning
THRU	On - Ring A or B (as indicated by LED label) is in through mode Flashing - Ring is twisted
WRAP	On - Ring A or B (as indicated by LED label) is in wrap mode Flashing - Ring is twisted
PROC	On - 3F55-01 hardware is ready for operation (port may or may not be enabled – controlled by software)
POWER	On - 3F55-01 hardware is receiving power
RX	Flashing - Port is receiving data
TX	Flashing - Port is transmitting data

Note: In Table 5-1 and Table 5-2, Ring A refers to the primary FDDI ring, and Ring B to the secondary FDDI ring. These LEDs do NOT correspond to FDDI MIC A and FDDI MIC B.

5.2 OPERATIONAL DIAGNOSTICS

Operational diagnostics for the 3F00-01/3F55-01 consist of built-in local and remote loopback tests. These tests can be initialized by your network management system, and the test results are reported back to the NMS.

When in local loopback, a port is disconnected from its network. The ATX generates loopback packets for the port, and the port loops the packets back without sending them into its network.

During a remote loopback test, the port is in normal operation, sending and receiving packets to its network. The ATX generates loopback packets which are sent out of the port to a particular destination device on the port's network. The destination device echoes the packet back onto the network, and the originating port receives the packet.

For both types of tests, normal operation is indicated when generated packets are received back (after looping) without errors. For remote loopback tests, the ATX creates LLC Type 1 test packets.

5.2.1 Troubleshooting

Refer to your *ATX User Guide* for additional guidelines on troubleshooting if the problem is outside the scope of this manual. Some common things to check are provided in the sections that follow.

Status LED Not Lit

If the STATUS LED is off on your 3F00-01 or 3F55-01:

1. Check the module status using the LCM `status` command.
2. Restart the module using the LCM `offline` and `online` commands.

5.2.2 Connectivity Problems

1. Check for LED abnormalities, such as WRAP LEDs on, or THRU LEDs or RX, TX LEDs not lit. (LED behavior during normal operation is explained earlier in this chapter.)
2. Check the status of the 3F00-01/3F55-01 port using LCM. The status can be either:
   - Wrapped – indicates breaks in the ring
   - Twisted – indicates that the two FDDI cables have been incorrectly connected
3. Check that the MICs are keyed correctly. See Chapter 2,**Connecting to the Network** for information about MICs.
4. Check for loose port connections.
5. Check to make sure the front panel screws are tight, so that the module is firmly seated against the ATX backplane.
6. Check the connections to the ring.

CHAPTER 6

ADDING/SWAPPING MODULES

Once you have received your ATX, you may want to add a new module to expand your network bandwidth, replace a module with a module of a different type, or swap a module with another module of the same type . If you are:

- Adding a 3F00-01 or 3F55-01 to a previously vacant slot or to a slot that had a different type of module (which includes replacing a 3F00-01 with a 3F55-01), see **Adding a 3F00-01 or 3F55-01** below, for instructions.
- Replacing a 3F00-01 with another 3F00-01 or replacing a 3F55-01 with another 3F55-01, see **Swapping a 3F00-01 or 3F55-01** for instructions.

The 3F00-01and 3F55-01 can be installed in any slot and you can install multiple modules in an ATX.

6.1 UNPACKING THE SWITCH MODULE

Unpack the 3F00-01 or 3F55-01 carefully, handling it by the edges only, and inspect it for possible damage. If any damage is evident, contact Cabletron Systems Global Call Center. Save the original container and antistatic wrap in case the module needs to be repaired.

6.2 ADDING A 3F00-01 OR 3F55-01

If the module you are adding is different from the type of module that was in the slot earlier, or if the slot was vacant, you have to reboot the ATX so it will recognize the new module. (Replacing a 3F00-01 with a 3F55-01 is considered replacing a module of a different type.)

If the module you are adding has a different number of ports than the module you are removing, before you can power cycle the ATX, you must:

- Delete all static addresses
- Delete all ARP addresses and IP routing table entries
- Delete all filters

1. Make sure the ATX is powered off.
2. Remove the network connections from the module you are going to replace.
3. Loosen the screws at each end of the front panel of the interface module you are going to replace.
4. Remove the installed interface module by pulling gently, but firmly, on the ears at the ends of the module's front panel.
5. Gently slide the switch module into the plastic guides in the module slot until it is completely inserted. Push the module firmly into place, as far as it will go, to fully engage the connectors at the back of the module with the backplane at the rear of the ATX chassis.
6. Tighten the screws on each side of the switch module's front panel.
7. Power on the ATX, and check the switch module LED power-on-sequence as described in Chapter 2, **Connecting to the Network**.
8. Make the connections to the network as described in Chapter 2.

6.3 SWAPPING A 3F00-01 OR 3F55-01

When swapping identical modules, it is recommended that you remove power to the ATX. However, the 3F00-01 or 3F55-01 you are replacing must be taken offline first, as described below:

Caution: Do not remove an interface module if its STATUS LED is on. If the STATUS LED is on, you must turn off power to the ATX, press the module's OFFLINE (or RESET) button, use LCM to take the module offline, or use an NMS to disable the module.

1. Take the module to be replaced offline, either by pressing the OFFLINE button on the module's front panel, or by using the Local Console Manager `offline` command.
2. Remove power from the ATX.
3. Remove the network connections from the module. Note the ports to which the network connections attach.
4. Loosen the screws at each end of the front panel of the module to be replaced.

5. Remove the installed module by pulling gently, but firmly, on the ears at the ends of the module's front panel.
6. Gently slide the new module into the plastic guides in the module slot until it's completely inserted. Push the module firmly into place, as far as it will go, to fully engage the connectors at the back of the module with the backplane at the rear of the ATX chassis.
7. Tighten the screws on each side of the module's front panel.
8. If you took the original module offline by pressing the OFFLINE button, the new module will automatically come back online when it is inserted in the slot.

   If you used the Local Console Manager `offline` command to take the original module offline, you must use the `online` command to bring the new module online.
9. Check the module LED power-on sequence as described in Chapter 2, **Connecting to the Network**.
10. Make the connections to the network as described in Chapter 2.

APPENDIX A
TECHNICAL SPECIFICATIONS

A.1 DATA RATE

100 Mbs

A.2 STANDARDS COMPLIANCE

Protocols

- ANSI X3T9.5 PMD, X3T9.5 MAC, X3T9.5, SMT v6.2, SMT v7.3
- IEEE 802.2, 802.1d, 802.1i

A.3 CERTIFICATIONS

Safety	UL 1950, CSA C22.2 No. 950, EN 60950, and IEC 950
Emission	FCC Part 15 Class A, EN 55022 Class A, and VCCI Class I
Immunity	EN 50082-1

A.4 FIBER CABLE

Multimode	62.5/125 μm
Single Mode	10/125 μm

A.5 OPTICAL

Output level	14 to 18.5 dBm
Input level	14 to 31 dBm

A.6 INTERFACE

- DAS (dual-attached station)

A.7 STATUS LEDS

- Status
- Power OK
- Receive activity
- Transmit activity
- Ring activity (one per primary and secondary ring)
- Thru mode (one per primary and secondary ring)
- Wrap mode (one per primary and secondary ring)

A.8 CONNECTORS

FDDI	3F00-01, Dual Multimode MIC Receptacles
	3F55-01, Dual Single Mode MIC Receptacles
Optical Bypass Switch	RJ-11 modular jack

A.9 MAX POWER REQUIREMENTS

3F00-01	30 watts
3F55-01	30 watts

A.10 PHYSICAL

Size	12.2 in. x 9.5 in. (30.99 cm x 24.13 cm)
Weight	2.27 lb. (1.03 kg)

A.11 ENVIRONMENTAL

Operating Temperature	5˚ C to 40˚ C (41˚F to 104˚F)
Storage Temperature	-30˚ C to 90˚ C (-22˚ F to 194˚ F)
Relative humidity:	5% to 95% (non-condensing)

APPENDIX B
CABLING INFORMATION

B.1 CABLES AND CONNECTORS

The 3F00-01 and 3F55-01 use standard fiber optic cables for connecting the MIC A and MIC B cables. The Optical Bypass Switch (OBS) uses an RJ-11 connector (an AMP 6-pin shielded modular plug for the OBS is recommended.) Pinouts for the connector at the end of the OBS cable are provided in Table B-1 below.

Table B-1 OBS Connector Pin Assignments

RJ-11 Pin	Assignment
1	+ 5 Secondary Switch
2	+ 5 Primary Switch
3	Ground Primary Switch
4	Ground Secondary Switch
5	Common to Pin 6
6	Common to Pin 5

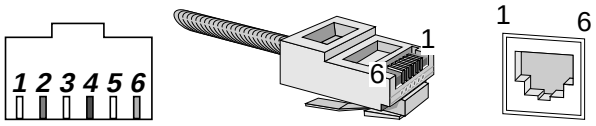

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Figure B-1 Pin Positions for OBS Cable

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